

**Notice of Allowability**

Application No.

10/510,943

Examiner

Chris H. Chu

Applicant(s)

MATANO ET AL.

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to \_\_\_\_.
2. ☒ The allowed claim(s) is/are 1-15.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 10/4,3/05
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_.

*Michelle R. Connelly-Cushwa*  
MICHELLE CONNELLY-CUSHWA  
PRIMARY EXAMINER

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The prior art documents submitted by applicant in the Informational Disclosure Statements filed on October 7, 2004 and March 28, 2005 have all been considered and made of record (note the attached copy of form PTO-1449).

### ***Drawings***

Two (2) sheets for formal drawings were filed October 7, 2004 and have been accepted by the Examiner.

### ***Specification***

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Allowable Subject Matter***

Claims 1-15 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claims 1-15 distinguishes over the prior art of record for the following reasons.

Regarding claims 1-4 and 8-15; the claims are allowable over the prior art of record because none of the references either alone or in combination disclose or render

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obvious an optical communication device substrate comprising one of a ceramic or glass ceramic having a thermal expansion coefficient of  $-55$  to  $-120 \times 10^{-7}/\text{C}^{\circ}$  and containing one of a  $\beta$ -quartz or a  $\beta$ -eucryptite solid solution as a main crystal wherein maximum thermal expansion hysteresis that occurs when a temperature rise from  $-40\text{C}^{\circ}$  to  $100\text{C}^{\circ}$  at a rate of  $1\text{C}^{\circ}/\text{min}$  and temperature lowering from  $100\text{C}^{\circ}$  to  $-40\text{C}^{\circ}$  at a rate of  $1\text{C}^{\circ}/\text{min}$  is less than 12 ppm. Goto teaches a glass ceramic with  $\beta$ -quartz or a  $\beta$ -eucryptite solid solution as a main crystal which exhibits hysteresis at less than 10 ppm, but has a coefficient of thermal expansion of between  $-5$  to  $+5$ , which does not coincide with the claimed coefficient of thermal expansion range. Beall et al. teaches an optical communication device substrate containing a  $\beta$ -quartz or a  $\beta$ -eucryptite solid solution as a main crystal which exhibits hysteresis at less than 12 ppm, but has a coefficient of thermal expansion outside the claimed range. Claims 2-4 and 8-15 depend from claim 1.

Regarding claims 5-7; the claims are allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious a method of manufacturing an optical communication device substrate containing a  $\beta$ -quartz or a  $\beta$ -eucryptite solid solution as a main crystal, and performing high temperature treatment at  $20\text{C}^{\circ}$  or higher and low temperature treatment at  $20\text{C}^{\circ}$  or lower, with the treatment performed multiple times and wherein the difference between the high and low temperatures is in the range of  $40$  to  $240\text{C}^{\circ}$ . Beall et al. teaches an optical communication device substrate containing a  $\beta$ -quartz or a  $\beta$ -eucryptite solid solution as a main crystal, but the temperature range between the high and the low

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temperatures is greater than 240C° and the low temperature is higher than 20C°.

Shindo also teaches a glass ceramic containing a  $\beta$ -quartz or a  $\beta$ -eucryptite solid

solution as a main crystal, but the heat treatment occurs over a range greater than 240

C°. Claims 6 and 7 depend from claim 5.

**Conclusion**

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris H. Chu whose telephone number is 571-272-8655. The examiner can normally be reached on 8:30 AM - 5:00 PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.



Chris H. Chu  
Patent Examiner  
April 21, 2006

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MICHELLE CONNELLY-CUSHWA  
PRIMARY EXAMINER